THE COMMITTEE ON ENERGY AND COMMERCE

INTERNAL MEMORANDUM

March 16, 2012

TO: Members, Subcommittee on Energy and Power

FROM: Committee Staff

RE: Hearing on "The American Energy Initiative"

On Tuesday, March 20, 2012, at 10:00 a.m. in room 2123 of the Rayburn House Office Building, the Subcommittee on Energy and Power will hold the seventeenth day of its hearing on "The American Energy Initiative." This day of the hearing will focus on the future of energy technology with an emphasis on Canadian oil sands.

I. WITNESSES

Dr. Eddy Isaacs
CEO
Alberta Innovates – Energy and Environment Solutions

Dr. John Nenniger
President and Chief Executive Officer
N-Solv Corporation

Mr. Murray Smith
Former Minister of Energy
Province of Alberta

Mr. Anton (Tony) Dammer
Former Director, Naval Oil Shale Reserve
U.S. Department of Energy

Mr. Bill McCaffrey
President and CEO
MEG Energy Corporation

Mr. Simon Dyer
Policy Director
The Pembina Institute

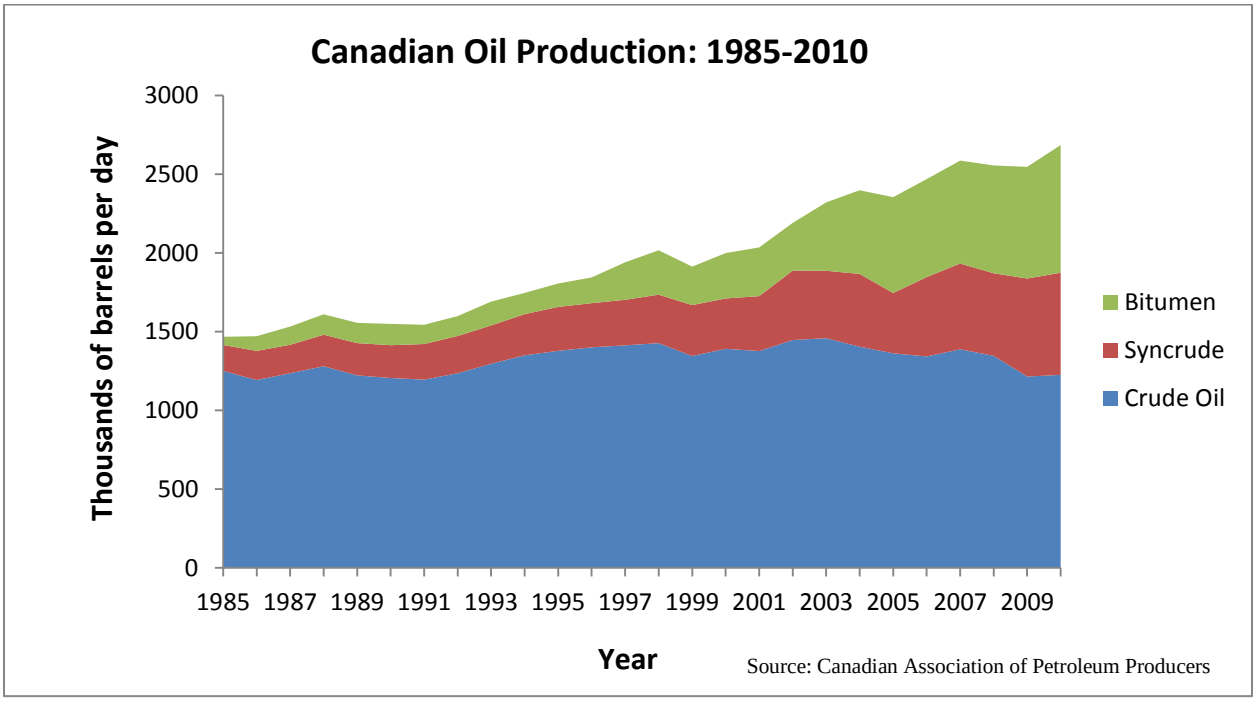
Ms. Melina Laboucan-Massimo
Climate & Energy Campaigner
Greenpeace Canada

II. BACKGROUND

The Athabasca, Cold Lake, and Peace River oil sands deposits, located in northern Alberta, Canada, are a series of unconventional oil resource basins which contain 175 billion barrels of recoverable oil. This recently-obtained estimate for Canada's proven reserves places it third in the world behind Saudi Arabia and Venezuela. While oil producers have been present in the oil sands since the 1960s, oil sands production has only become significant over the past 10

years. This development has been made possible by technological developments that allow producers to extract oil in a more efficient and cost-effective manner.

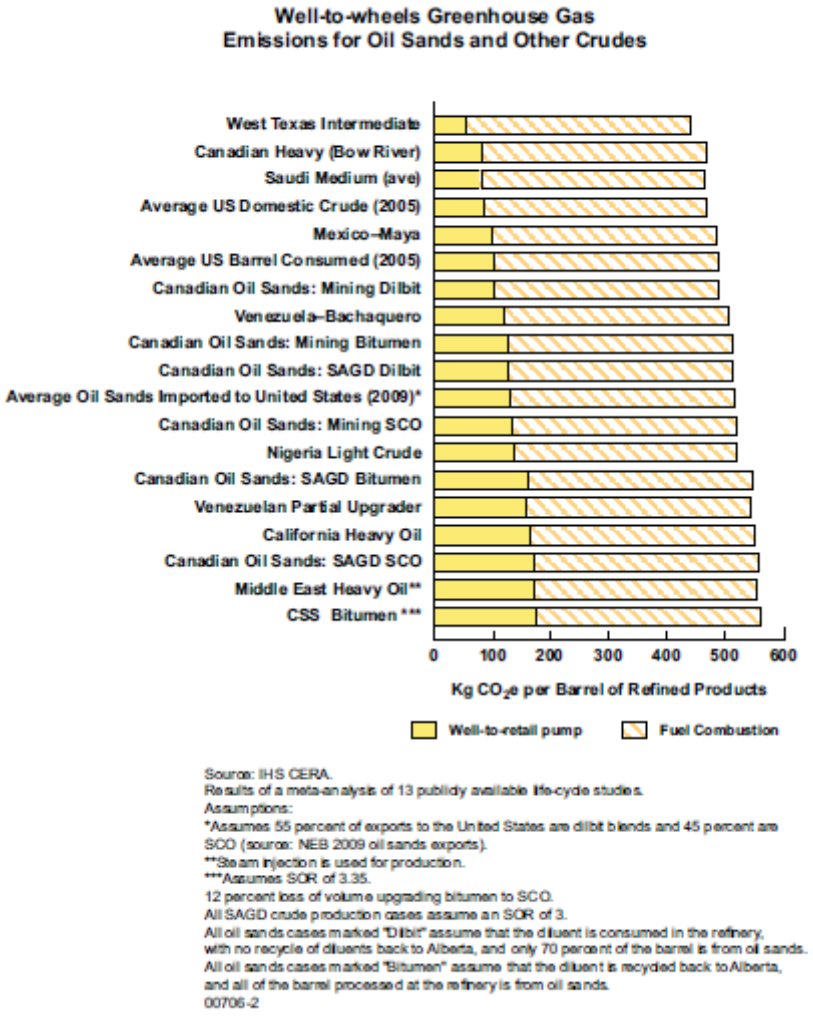
Oil sands crude is an unconventional resource because it cannot be produced by conventional drilling. The raw resource is a conglomerated material composed of bitumen (a heavy, viscous form of crude oil), sand, clay, and water. In its natural state, it is illiquid and will not flow into a conventional oil well. It therefore must be produced by other means. The two main processes used today to extract oil sands are open-pit mining and "in-situ" production.



Mining is only appropriate where the oil sands deposit lies close the surface. When this is the case, the layers of soil above the deposit (also called "overburden") are removed and stored nearby. Once the deposit is exposed, teams of steam shovels and large dump trucks extract the bitumen-laden soil and move it to an on-site facility that separates the bitumen from the associated material. The bitumen is sent to another facility where it is upgraded into synthetic crude oil (syncrude) or combined with naphtha and other chemicals to become diluted bitumen (dilbit). From that point it enters the pipeline network and is distributed to refineries.

In-situ production occurs where oil sands deposits are too deep beneath the surface for open-pit mining. At an in-situ facility, the steam-assisted gravity drainage (SAG-D) process is used to extract bitumen. This process requires multiple pairs of wells to be drilled into the deposit. For every pair, one well carries steam into the deposit, which heats the nearby bitumen, separating it from surrounding clay and sand, and allowing it to flow to a second well which takes the raw bitumen back to the surface. Eighty percent of the Athabasca oil sands are accessible only through in-situ production – the remainder must be produced through open pits.

Open-pit mining and in-situ production have environmental challenges. With mining, the land use is substantial as most open pits encompass several square miles and alter the landscape permanently. Additionally, the residual clay, sand, and water which are separated from the bitumen during the upgrading process must be stored in large man-made ponds for several years. Over time, the pond can be drained and the land reclaimed – but only after the solid wastes have been removed entirely. This process has taken decades at older mine sites as sand, silt, and clay particles (referred to as "mature fine tailings") remain suspended in the water for several years. Other challenges associated with tailings ponds include their impact on wildlife. Lingering bitumen in tailings ponds can be toxic and present a threat to migratory waterfowl specifically. To counter this, mine operators deploy various devices to discourage birds from landing on or near the pond. Additionally, leaching from the tailings pond must be constantly monitored and controlled. New technologies are being developed and deployed to shrink the amount of time a pond will be utilized. Company and government research funding is being directed to finding ways to reduce the required time for mature fine tailings to settle at the bottom of the pond, which allows the land reclamation process to begin. Some technologies now allow a pond to be reclaimed in under 10 years.



Because of the amount of large trucks and earth-moving equipment present at an open-pit mine, a tremendous amount of fuel is required to produce oil sands in this manner. With in-situ facilities, the constant need for steam requires large amounts of energy to heat on-site boilers. These energy requirements contribute to oil sands having a larger "wells-to-wheels" greenhouse gas emissions figure than many conventional crude oils. However, government- and industry-led research is contributing towards lower emissions, water consumption, and energy intensity for many oil sands operations. At in-situ facilities, for instance, water requirements are substantial. While many earlier facilities used freshwater for steam, advancements in water recycling technologies and the effective use of brackish water have greatly decreased freshwater usage. Likewise, advancements in boiler efficiency lower the energy requirements for the facility – many of which utilize natural gas that can be produced on the lease.

Alberta's chief regulatory bodies for the oil sands industry – the Energy Resources Conservation Board, the Alberta Department of Environment, and the Alberta Department of Sustainable Resource Development – maintain robust rules and standards on such topics as tailings management, land reclamation, water allocation, groundwater monitoring, noise levels, and waste management. Additionally, enforcement actions are regularly taken in response to violations.

III. ISSUES

The following issues will be examined at the hearing:

- Government and industry research efforts that led to the rapid development of the oil sands;
- Government and industry research efforts on improved environmental performance at oil sands production facilities;
- Local economic and societal effects of increased oil sands production; and,
- Projections for future oil sands production as well as its environmental and economic effects.

IV. STAFF CONTACTS

If you have any questions regarding this hearing, please contact Garrett Golding or Ben Lieberman at (202) 225-2927.